CLAIMS

What is claimed is:

1. A modem comprising:

a carriergroup transmitting means coupled to a transmission channel;

a carriergroup receiving means coupled to the transmission channel for receiving parameters relating to a plurality of carriers in the transmission channel; and

a carriergrouping means, coupled to the carriergroup transmitting means and to the carriergroup receiving means, for determining at least one carriergroup parameter and at least one carrier group for the plurality of carriers in the transmission channel based on the parameters received by the carriergroup receiving means;

wherein the carriergroup transmitter means transmits at least one message to the transmission channel comprising the at least one carriergroup parameter and the at least one carrier group.

2. The modem of claim 1 wherein the at least one carriergroup parameter transmitted by the carriergroup transmitting means is a carriergroup SNR parameter for the plurality of carriers.

3. The modem of claim 1 wherein the at least one carriergroup parameter is the worst case SNR for the at least one carriergroup.

4. The modem of claim 1 wherein the carriergroup parameter is a carriergroup bitloading parameter.

5. The modem of claim 1 wherein the size of the at least one carriergroup is fixed.

6. The modem of claim 1 wherein the size of the at least one carriergroup is variable.

7. The modem of claim 1 wherein at least one message to the transmission channel comprising the at least one carriergroup parameter and the at least one carrier group is used to set up a tone encoder in a far-end modem coupled to the transmission channel.

8. A method for grouping a plurality of carriers in a DMT communication system, the method comprising the steps of:

determining at least one carrier group for the plurality of carriers;

determining at least one carriergroup parameter for the at least one carrier group; and

sending at least one message comprising the at least one carriergroup parameter.

9. The method of claim 8 wherein the step of determining a carriergroup parameter for the carriergroup further comprises the step of

determining a carriergroup signal-to-noise ratio for the at least one carrier group.

10. The method of clam 8 wherein the carriergroup signal-to-noise raito for the at least one carrier group is the worst case signal-to-noise ratio for the at least one carrier group.

11. The method of claim 8 wherein the step of determining a carriergroup parameter for the carriergroup further comprises the step of

determining at least one carriergroup bitloading for the at least one carriergroup.

12. The method of claim 8 wherein the at least one carriergroup has a fixed size.

13. The method of claim 8 wherein the size of the at least one carriergroup of the plurality of carriers is variable and determined dynamically.

14. The method of claim 8 wherein at least one message comprising the at least one carriergroup parameter is used to set up a tone encoder in a far end modem.

15. A method for grouping a plurality of carriers in a DMT communication system, the DMT communication system comprising a near end and a far end modem, the method comprising the steps of:

determining at least one carriergroup from the plurality of carriers;

determining a carriergroup signal-to-noise ratio for the at least one carriergroup;

determining a carriergroup bitloading and a carriergroup gain for the at least one carriergroup based on the carriergroup signal-to-noise ratio; and

using the carriergroup bitloading and the carriergroup gain for the at least one carriergroup for transmitting messages from the near end modem to the far end modem.

16. The method of claim 15 wherein the carriergroup signal to noise ratio for the at least one carriergroup is the worst case signal to noise ratio for the plurality of carriers.

17. The method of claim 15 wherein the at least one carriergroup has a fixed size.

18. The method of claim 15 wherein the at least one carriergroup is determined dynamically.

19. The method of claim 15 wherein the communication system is a VDSL system.

20. A modem for grouping a plurality of carriers in a DMT communication system coupled to a far-end modem via a transmission channel, the modem comprising:

carriergrouping means for determining multiple carrier groups for the plurality of carriers and for determining at least one carriergroup parameter for each of the multiple carrier groups; and

carriergroup transmitting means for transmitting messages comprising the at least one carriergroup parameter to the far-end modem via the transmission channel, to enable the far-end modem to send and receive messages using the multiple carrier groups.

21. The modem of claim 20 wherein the at least one parameter received by the receiving means is a signal to noise ratio.

22. The modem of claim 20 wherein the carriergroup parameter for each of the multiple carrier groups is the worst case signal-to-noise ratio for the specified carrier group.

23. The modem of claim 20 wherein the carriergroup parameter is a carriergroup bitloading parameter.

24. The modem of claim 20 wherein the size of the multiple carrier groups is fixed.

25. The modem of claim 20 wherein the size of the multiple carrier groups vary.

26. The modem of claim 20 wherein the messages comprising the at least one carriergroup parameter is used to set up a tone encoder in the far-end modem coupled to the transmission channel.